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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,370	07/05/2006	Fusheng Xie	AWUPCT122305-04-PAT16	3903
30265 7590 01/08/2009 DAVID AND RAYMOND PATENT FIRM 108 N. YNEZ AVE., SUITE 128 MONTEREY PARK, CA 91754				
EXAMINER				
SINGH, PREM C				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/562,370

## Applicant(s)

XIE, FUSHENG

## Examiner

PREM C. SINGH

## Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 13-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

NOTE: Claims 1-11 as originally filed 07/05/2006 were examined on merits. The status identifier for claim 12 in the Applicant's amendment filed 10/01/2008 as "withdrawn" is not correct. It should be identified as "New and withdrawn".

1. Cancellation of claims 1-11, withdrawal of claim 12, and addition of new claims 13-30 is noted.
2. New abstract is noted.
3. New grounds of rejection necessitated by new claims follow.

### ***Claim Objections***

4. Claim 13 is objected to because of the following informalities:

Claim 13 (a) (line 4): --".....wherein a cracked gas is start to be produced...."—  
needs to be reworded.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "relatively short cycle of production" in claim 13 (d) (line 2) is a relative term which renders the claim indefinite. The term "relatively short cycle of production" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 13-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (US Patent 4,175,211) in view of Stankevitch (US 2003/0047437 A1) and Zhou et (US Patent 5,744,668) and further in view of Applicant's Admitted Prior Art.

9. With respect to claim 13, Chen discloses a process for producing gasoline, kerosene, and diesel oil from waste plastic and rubber (See figure 1 and column 2, lines 1-20). The process comprises:

(a) Catalytically cracking waste plastic and waste rubber in the presence of petroleum oil at a cracking temperature of about 850°F (454°C) (See column 2, lines 3-20; column 6, lines 24-26). It is to be noted that petroleum oil encompasses machine oil.

Chen invention does not specifically disclose adding quartz and sand into the waste raw material.

Chen invention does not specifically disclose steps (b)-(d) of catalytically cracking the gas fraction, fractionating the oil stream, and treating different distillate fractions, however, the invention does disclose separation of cracked effluents from step (a) and producing gasoline, kerosene, and diesel along with light gases (See figure 1 and column 6, lines 34-49).

Stankevitch discloses a process similar to Chen for converting waste plastic and rubber into hydrocarbon oils in a fluidized bed pyrolysis reactor under similar operating conditions (See page 2, paragraph 0031; page 3, paragraph 0032). Stankevitch also discloses that grainy inert materials like quartz and sand are used for making a fluidized

bed. This material can be used as a circulating heat carrier (See page 1, paragraph 0005; page 2, paragraph 0015).

Zhou invention discloses a process similar to Chen for producing gasoline and diesel by using waste rubber and plastic under similar operating conditions (See column 3, lines 5-17). Zhou also discloses that the gases from the cracking (pyrolysis) reactor are taken to a fixed bed reactor, gotten rid of sulfur, nitrogen, and chlorine compounds, most of acidic gases and odoriferous gases, and simultaneously, the primary reaction of catalytic cracking proceeds (See column 2, lines 21-26; column 3, lines 23-34). Zhou uses a cracking catalyst comprising ZSM-5 (which is a 5Å molecular sieve) (See column 4, lines 53-54).

Zhou invention further discloses passing the cracked gases to fractionation and collecting gasoline and diesel fractions (See column 3, lines 49-67; column 4, lines 1-3). It is to be noted that Zhou collects gasoline in storage tank (18) after passing through separation device (16) and diesel in storage tank (17) after passing through separation device (15) (See figure 1). Although Zhou does not specifically disclose collecting kerosene, it is known to those skilled in the art that separators (15 and 16) must be producing kerosene fractions, because kerosene has a boiling range between gasoline and diesel.

Although Zhou invention does not specifically disclose treating fractions of gasoline, kerosene, and diesel oils, however, the invention does disclose devices (8) and (9) to remove acidic and odoriferous gases from the cracked gases. Thus, one skilled in the art would treat gasoline, kerosene, and diesel fractions by passing through

devices (8) and (9) to enhance their quality by further reducing acidic and odoriferous gases. Since Zhou is conducting treatment of gasoline, kerosene and diesel similar to the claimed invention, Zhou's process should necessarily be producing high quality oil product in a short cycle of production.

It is to be noted that the Applicant's admitted prior art also discloses, "The process of catalytic cracking and adsorbing in the fixed bed are based on those in the prior art" (See specification, page 2, paragraph 2).

Since Chen is producing cracked products including about 12% C<sub>3</sub>- gases (See column 10, lines 64-68), it would have been obvious to one skilled in the art at the time the invention was made to modify Chen invention, by adding quartz and sand as disclosed by Stankevitch to improve mixing and heat transfer in the fluidized bed and crack the resulting gases, obtained from the fluidized bed cracking of waste plastic, rubber, and petroleum oil, in a fixed bed reactor as disclosed by Zhou and by the Applicant's admitted prior art. This integrated process will enhance the production of high quality gasoline, kerosene and diesel fractions from waste plastics and rubbers.

Stankevitch invention does not specifically disclose amount of quartz and sand in the feed, however, the invention does disclose particle size, density and residence time in the reactor (See Examples 1, 2 and 3, page 5). Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Stankevitch invention and specify the amount of sand and quartz for proper heat balance in the process.

10. With respect to claim 14, Chen invention discloses that feed streams are mixed and maintained at a temperature within a range of 500-700°F (260-371°C) for a sufficient time (See column 5, lines 60-63). Chen further discloses that the reactor temperature is about 850°F (454°C) (See column 6, lines 24-26). This implies that the cracking temperature in step (a) is gradually increased.

11. With respect to claims 15 and 16, Zhou discloses that the gases from the cracking (pyrolysis) reactor are taken to a fixed bed reactor, gotten rid of sulfur, nitrogen, and chlorine compounds, most of acidic gases and odoriferous gases, and simultaneously, the primary reaction of catalytic cracking proceeds (See column 2, lines 21-26; column 3, lines 23-34). Zhou uses a cracking catalyst comprising ZSM-5 (which is a 5Å molecular sieve) (See column 4, lines 53-54). Although Zhou invention does not specifically disclose the other claimed packing material(s) in the fixed bed reactor, it is expected that the invention should necessarily be using similar packing materials as claimed because the invention is removing sulfur, nitrogen, acidic, and odoriferous gases.

12. With respect to claims 17 and 18, Zhou invention does not specifically disclose the addition of claimed substance in step (c) during fractionation, however, the invention does disclose addition of NaOH or KOH to remove acidic and odoriferous gases from cracked feedstock (See column 3, lines 23-34). Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify Zhou invention and

add an alkali/alkaline material, including the claimed mixture of cobaltic phthalocyanin sulfonate, NaOH and H<sub>2</sub>O<sub>2</sub>, during fractionation for further removal of acidic and odoriferous impurities. It is expected that the claimed mixture will further improve the quality of distillates by removing impurities. It would also have been obvious to use the claimed ingredients in their proper proportion to produce cobaltic phthalocyanin.

13. With respect to claims 19 and 20, Zhou invention discloses the boiling range for gasoline from 64 to 185°C and for diesel from 176 to 290°C (See column 7, Table 3). It is known to those skilled in the art that kerosene has a boiling range in between gasoline and diesel. It is to be noted that the boiling ranges of gasoline, kerosene and diesel fractions are adjustable to meet the market requirements.

14. With respect to claims 21 and 22, Zhou invention discloses that gasoline fraction is introduced into condenser (14) from the top of fractionating column (25) and enters a gasoline storage tank (18) through separation facility (16) for removing oil and water (See column 3, lines 63-66).

Zhou invention does not specifically disclose the temperature range, however, the invention does disclose that the cracking product is condensed in condenser (19) and cooled to room temperature (See column 3, lines 49-51).

Zhou invention does not disclose treatment of gasoline fraction with active kaolin.

Stankevitch invention discloses that if the waste plastics comprise chlorinated polymers, for example PVC, the hydrogen chloride produced in the cracking process

should be recovered in a packed bed adsorber of a proper grainy adsorbent, for example calcium oxide (See page 2, paragraph 0017). Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the integrated Chen, Stankevitch, and Zhou process by adding kaolin in the adsorber for chloride removal, because calcium oxide and kaolin, both are expected to be functionally similar.

15. With respect to claims 23 and 24, Zhou invention discloses that the liquid oil mix in the buffer vessel (21) is treated with sulfuric acid (See column 3, lines 58-60). It is to be noted that the liquid oil mix comprises diesel (See column 3, lines 58-67; column 4, lines 1-3). Zhou also discloses that the cetane ratio of diesel is 45-60 (See column 5, lines 20-21).

Zhou invention does not specifically disclose acid strength and amount, alkali treatment and cetane additive.

It is known to those skilled in the art that sulfuric acid typically used in the process is 98%.

It would have been obvious to one skilled in the art at the time the invention was made to treat the acid treated diesel with an alkali, like NaOH, to neutralize the acidity caused by sulfuric acid. It would also have been obvious to use acid and alkali in appropriate amounts, including as claimed, to properly remove impurities and neutralize the finished diesel.

Diesel produced in Zhou process has a cetane ratio of 45-60, which can be improved by adding additives, for example alkyl nitrates which are known in the art. It is also evidenced by web pages (Attached).

16. With respect to claims 25-30, Chen invention discloses that waste plastics and rubbers in presence of petroleum oil are used for producing gasoline, kerosene, and diesel and the cracking in step (1) is at a temperature of 850°F (454°C) (See column 2, lines 3-20; column 6, lines 24-26).

Chen invention does not specifically disclose machine oil, however, the invention does disclose use of high boiling petroleum derived streams such as FCC bottoms, TCC syntower bottoms, coker gas oil, heavy cycle oil, light cycle oil, slurry oil, coal tar, and mixtures thereof (See column 3, lines 34-58). It is expected that the streams disclosed by Chen will be functionally similar to machine oil.

### ***Response to Arguments***

17. Applicant's arguments filed 10/01/2008 have been fully considered but they are not persuasive.

18. The Applicant argues,

"The process of Chen et al can only be performed to only converse solid plastic wastes. But the process of the instant invention can be performed to converse solid wastes including plastic and rubber and liquid wastes including machine oil. Chen et al does not teach any quartz and sand mixing with the

shredded waste plastics in the reactor. It is apparent that Chen et al fails to teach the cracking temperature is set initially at 50°C and is increased to 480°C, wherein the temperatures disclosed by Chen et al fails to teach the range of cracking temperature for catalytically cracking the mixture of waste raw materials, quartz, and sand. Chen never teaches any quartz being added into shredded waste plastics and any quantity of quartz required for cracking process. Chen never teaches any sand being added into shredded waste plastics and any quantity of sand required for cracking process. Chen et al is silent regarding any further catalytically cracking process of the gas. Again, Chen et al is silent regarding any fractionation process of the gasoline fraction. Chen et al fails to suggest the step of frequently adding a mixture of cobaltic phthalocyanin sulfonate, NaOH, and H<sub>2</sub>O<sub>2</sub> into said oil stream every 5 to 8 hours, as claimed in claims 17 and 18 in addition to what is claimed in claim 13 as a whole. Chen et al does not teach the gasoline is fractionated at a top part of the fractionating tower with a temperature between 195°C to 198°C, the kerosene is fractionated at a middle part of the fractionating tower with a temperature between 200°C to 230°C, and the diesel is fractionated at a bottom part of the fractionating tower with a temperature between 300°C to 360°C. Chen et al fails to teach how to treat the fraction of gasoline as claimed in claims 21 and 22 in addition to what is claimed in claim 13 as a whole. Chen et al fails to teach how to treat the fraction of diesel oil as claimed in claims 23 and 24 in addition to what is claimed in claim 13 as a whole. Chen et al fails to teach the cracking temperature is set from 60°C to 460°C for cracking waste plastics as claimed in claims 25 and 26 in addition to what is claimed in claim 13 as a whole. Chen et al fails to teach the cracking temperature is set from 80°C to 480°C for cracking waste rubbers as claimed in claims 27 and 28. Chen et al fails to teach the cracking temperature is set from 50°C to 380°C for cracking waste machine oil as claimed in claims 29 and 30 in addition to what is claimed in claim 13 as a whole”.

The Applicant's argument is not persuasive because Chen teaches use of plastic, rubber and petroleum oil, and a reactor temperature of 150-700°F to produce gasoline and distillates; Stankevitch discloses use of quartz and sand; Zhou teaches cracking of gases obtained from the cracking (pyrolysis) reactor, passing the cracked

gases to fractionation and collecting gasoline and diesel fractions, treating devices to remove acidic and odoriferous gases from the cracked hydrocarbons by addition of NaOH or KOH, boiling ranges of gasoline and diesel, treatment of gasoline and diesel by condensation (See office action above under different claims).

19. The Applicant argues,

"Whether the claims 13 to 30 as amended of the instant invention are obvious depends on whether the above differences (a) to (q) between the instant invention and Chen et al are obvious in view of Stankevitch and/or Zhou et al at the time of the invention was made".

The Office action presented above clearly establishes that the claimed invention is *prima facie* obvious over Chen in view of Stankevitch and Zhou and further in view of Applicant's Admitted Prior Art.

20. The Applicant argues,

"Stankevitch fails to teach quartz and sand are mixed with the waste raw materials, including plastic, rubber and/or machine oil, in the cracker for catalytically cracking process at the cracking temperature starting from 50°C to 480°C. A mere of recitation from Stankevitch of using grainy inert material for making a fluidized bed does not provide any suggestion of mixing quartz and sand with the waste raw materials in the cracker for catalytically cracking process as taught in the instant invention to provide the effects of: 1. accelerating the cracking; 2. expanding bores in raw materials to get through channels; 3. improving the quality of the oil product by eliminating iron from the feed; 4. reducing coking in the cracker; 5. increasing the yield of oil products; and 6. shortening the production cycle".

The Applicant's argument is not persuasive because Stankevitch discloses, "Grainy inert material, for example, quartz, sand or ceramic crumb, are used for making a fluidized bed. This material can be used as a circulating heat carrier" (Paragraph 0005). Stankevitch further discloses mixing of shredded waste plastics with quartz/sand, heating and pyrolysing at a temperature of 400-900°C and fractionating the pyrolysis products (See paragraph 0033, 0048). Thus, the cited effects of (1) through (6) obtained in the Applicant's process should necessarily be achieved in Stankevitch process also.

21. The Applicant argues,

"A mere recitation of Zhou et al of "the products of catalytic cracking from the device are introduced into a condenser in which they are cooled to room temperature" does not teach how to fractionate the oil stream at different temperatures within the fractionating tower. The applicant respectfully submits that Zhou et al does not teach the gasoline is fractionated at a top part of the fractionating tower with a temperature between 195°C to 198°C, the kerosene is fractionated at a middle part of the fractionating tower with a temperature between 200°C to 230°C, and the diesel is fractionated at a bottom part of the fractionating tower with a temperature between 300°C to 360°C. In other words, the gasoline, kerosene, and diesel are fractionated at different parts of the fractionating tower at different temperatures but not by cooling the steam at the room temperature".

The Applicant's argument is not persuasive because Zhou shows a fractional column [25] by a box (See figure 1). It is known to those skilled in the art that a fractionating column is not only a box but a tall tower with trays in it. Additionally, Zhou discloses, "The oil mix is pumped into heat exchanger 24 with pump 23 to be heated to a temperature of 300-400 degree C., then introduced into fractional column 25, in which

gasoline and diesel are separated in different distillation cuts. Gasoline is introduced into condenser 14 from the top of column 25, and enters a gasoline storage tank 18 through separation facility 16 for removing oil and water. Diesel enters a stripper 26 from the middle of the fractional column 25. Diesel is introduced into the condenser 13 after treatment by the overheated vapor, then enters the diesel storage tank 17 through the fractional column 25" (Column 3, lines 60-67). It is also known to those skilled in the art that kerosene is a fraction obtained in between the gasoline and diesel cuts. Zhou further discloses gasoline and diesel boiling ranges (See Table 3, column 7). It is to be noted that the boiling ranges of gasoline and diesel disclosed by Zhou are lower as compared to the Applicant's claimed ranges. However, Chen discloses boiling range of gasoline, kerosene and diesel to be 215°C-; 215-343°C; and 343-427°C, respectively (See column 9, Table I). Obviously, one skilled in the art could adjust the boiling range of hydrocarbons as needed and demanded by the market.

22. The Applicant argues,

"To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited art references for combination in the manner claimed... [T]he suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness..." *In re Gorman*, 933 F.2d 982, 986, 18 USPQ 2d 1885, 1888 (Fed. Cir. 1991).

Accordingly, the applicant believes that neither Chen et al, Stankevitch nor Zhou et al, separately or in combination, suggests or makes any mention whatsoever of the difference subject features (a) to (q) as claimed in the amended claims 13 to 30 of the instant invention".

The Applicant's argument is not persuasive because Chen discloses a process for producing oil product from waste materials including plastic, rubber and petroleum oil by cracking at a temperature in the claimed range (See Chen: column 2, lines 3-20; column 6, lines 24-26). Chen does not disclose using quartz and sand in the waste material and does not disclose further cracking of the cracked gases obtained by cracking the waste materials.

Stankevitch discloses a process of converting waste plastics into hydrocarbon oils in a pyrolysis reactor similar to the Chen process under similar operating conditions. Stankevitch further discloses mixing of shredded plastics with quartz/sand particles in a pyrolysis reactor wherein the quartz/sand particles are used as heat carrier. This arrangement provides several advantages (See Stankevitch: paragraph 0036, 0037, 0038, 0039, 0048).

Zhou discloses a process similar to Chen for producing hydrocarbon oils using waste rubber and plastics by pyrolysis under similar operating conditions (See Zhou: column 3, lines 5-17). Zhou further discloses cracking of gases obtained by cracking the waste materials, and simultaneously getting rid of sulfur, nitrogen, chlorine compounds, acidic gases and odoriferous gases; and finally taking the gases to fractionation to collect hydrocarbon oils.

Thus, it would have been obvious to one skilled in the art at the time of invention to modify Chen invention by incorporating quartz/sand particles as heat carriers as disclosed by Stankevitch, and adding a step of cracking the cracked gases obtained by waste pyrolysis as disclosed by Zhou, for an integrated process of producing hydrocarbon oils by pyrolysis of waste plastics, rubbers and petroleum oils.

23. In conclusion, the claimed invention is *prima facie* obvious over Chen in view of Stankevitch and Zhou.

### ***Conclusion***

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PREM C. SINGH whose telephone number is (571)272-6381. The examiner can normally be reached on 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

